Introduction

Climate Data Analysis Tools (**CDAT**) is a software infrastructure that uses an object−oriented scripting language to link together separate software subsystems and packages, thus forming an integrated environment for solving model diagnosis problems. The power of the system comes from Python and its ability to seamlessly interconnect software. Python provides a general purpose and full−featured scripting language with a variety of user interfaces including command−line interaction, stand−alone scripts (applications) and graphical user interfaces (GUI). The CDAT subsystems, implemented as modules, provide access to and management of gridded data (Climate Data Management System or **CDMS**); large−array numerical operations (Numerical Python); and visualization (Visualization and Control System or **VCS**).

One of the most difficult challenges facing climate researchers today is the cataloging and analysis of massive amounts of multi−dimensional global atmospheric and oceanic model data. To reduce the labor intensive and time−consuming process of data management, retrieval, and analysis, PCMDI and other DOE sites have come together to develop intelligent filing system and data management software for the linking of storage devices located throughout the United States and the international climate research community. This effort known as the Earth System Grid (ESG) and headed by PCMDI, NCAR, and ANL will allow users anywhere to remotely access this distributed multi−petabyte archive and perform analysis. PCMDI's CDAT utilizes ESG and is an innovative system that supports exploration and visualization of climate scientific datasets. As an "open system", the software sub−systems (i.e., modules) are independent and freely available to the global climate community. CDAT is easily extended to include new modules and as a result of its flexibility, PCMDI has integrated other popular software components, such as: the popular Live Access Server (LAS) and the Open Data Access Protocol (OPeNDAP) − formerly known by the name Distributed Oceanographic Data System (DODS). Together with ANL's Globus middleware software, CDAT's focus is to allow climate researchers the ability to access and analyze multi−dimensional distributed climate datasets.